cc: Leslie

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SECRETARY, BOARD OF OIL, GAS & MINING

BEFORE THE BOARD OF OIL, GAS AND MINING
DEPARTMENT OF NATURAL RESOURCES
STATE OF UTAH

LIVING RIVERS, Petitioner, v. UTAH DIVISION OF OIL, GAS AND MINING, Respondent, RED LEAF RESOURCES, INC., Intervenor-Respondent.	**RED LEAF RESOURCES, INC.'S EXPERT WITNESS REPORT, FRANCIS A. AMENDOLA, NORWEST CORPORATION** **[Corrected to add page 7]** Docket No. 2012-17 Cause No. M/047/0103

I. INTRODUCTION AND QUALIFICATIONS

A. I am Francis A. Amendola, Vice President, Environmental Services, Norwest Corporation, located at 136 East South Temple, 12th Floor, Salt Lake City, Utah 84111.

B. Red Leaf Resources, Inc. ("RLR"), has requested me to testify as an expert in these proceedings regarding my work on their behalf to prepare the Notice of Intention to Commence Large Mining Operations, Red Leaf Resources, Inc. Southwest #1 Project ("NOI") approved by the Utah Division of Oil, Gas and Mining ("Division" or "DOGM").

C. A summary of my educational and professional background is attached in my CV as **Exhibit A.**

D. Responsibility for preparing the NOI: I was responsible at Norwest for compiling documents/reports to support the NOI mining and reclamation plan. I drafted sections of the NOI that summarized findings and referenced these stand-alone documents, as well as providing input on the reclamation plan. This included documents/ reports prepared by Norwest, as well as documents prepared by other consultants. Norwest was responsible for preparing the mine plan, reclamation plan including slope stability and geotechnical considerations (Appendix I), and the drainage control plan (Appendix E.)

E. The NOI preparation and review process: Norwest's compilation of the NOI was an iterative process involving several consulting companies with expertise in particular areas (mine plan, reclamation, resource processing, environmental studies (hydrology, vegetation, wildlife, etc.) and Red Leaf staff. Individual reports were prepared by consultants, reviewed by myself and others, and then integrated into sections of the NOI to address each requirement of the regulations.

F. Responsibility for preparing the Ground Water Discharge Permit Application ("**GWDPA**"): The GWDPA is separate from DOGM's NOI and is being processed by the Utah Department of Environmental Quality, Division of Water Quality ("**DWQ**"). I coordinated the development of the GWDPA "cover study," HELP Model and Drainage Control Plan, and Geotechnical Analysis completed by Norwest hydrologists and engineers, as well as geologic information provided by Norwest geologists. I also coordinated the preparation of figures/maps that described the sequence of activities involved with the mine plan and processing

phase of the operation. In some cases, these were figures/maps developed from original work of other consulting companies. I reviewed reports prepared by other consultants and commented on the GWDPA at various stages of preparation.

G. The status of GWDPA review: DWQ initially had questions as to whether a GWDPA was required for the Southwest #1 Project. After some deliberation, DEQ determined that an application was required. Red Leaf submitted to DWQ its limited GWDPA dated December 20, 2011. Initial responses to DWQ questions were reviewed and discussed in a meeting between Red Leaf and the agency on February 7, 2012. A follow-up meeting was held between Red Leaf and DWQ to discuss responses to the DWQ Completeness Review comments dated February 10, 2012. Red Leaf's formal written response to DWQ's February 10 comments has not yet been submitted to the agency. Red Leaf's response to DWQ regarding the GWDPA is not at issue in the Board proceedings regarding DOGM's NOI.

II. PURPOSE AND SUMMARY OF TESTIMONY

A. The purpose of my testimony is as follows:

1. My testimony and expert report addresses the NOI, particularly as to the mining and reclamation plan, and the backing walls which support the capsules as addressed by the Norwest Geotechnical Analysis (NOI, Appendix I). I will address the capsule construction and deformation process. NOI, § 106.2, pp. 11; 17. My testimony also addresses the HELP Model results that are used to predict the rate that water would

move through the cover material of the capsules. I will address the adequacy of the NOI to meet the requirements of the Utah Mined Land Reclamation Act, Section 40-8-1, and implementing regulations.

2. I will address how Norwest worked with RLR and responded to DOGM to prepare an NOI application which provides descriptions of ground water resources designed to meet the requirements of R647-4-106.8 (depth to ground water) and R647-4-100.1 (narrative description of ground water impacts.)

3. In addition, I will rebut the allegations of Living Rivers regarding the inadequacies in the NOI and the Project design to prevent ground water contamination.

4. Finally, I will address how the GWDPA has been prepared to demonstrate that the Project will protect ground water quality.

B. In my expert opinion, the NOI as approved by the Division meets the requirements for approval under the Utah Mined Land Program and is appropriately conditioned upon the issuance or a ground water quality permit by the DWQ or upon DWQ's determination that no such permits are required.

III. DESCRIPTION OF GROUND WATER RESOURCES—DEPTH TO GROUND WATER

A. The NOI is written to track the applicable sections of the Utah Minerals Regulatory Program ("**Minerals Program**") rules which govern the NOI

application and approval process. Geologic and ground water resources are described in accordance with Minerals Program rules as follows:

1. NOI Chapter II, R647-4-105 maps, drawings and photographs including:

    a. Figure 13, stratigraphic density log; Figure 14, surface water resource map; Figure 17, overall geology of Project area.

2. NOI Chapter III, R647-4-106 Operations Plan including:

    a. 106.8 Depth of Ground Water, Extent of Overburden Material and Geologic Setting;

3. NOI Chapter VI, R647-4-109, Impact Statement including

    a. 109.1 Projected Impacts to Surface and Ground Water Systems.

4. NOI Appendices including:

    a. Appendix I – Norwest Geotechnical Analysis;

    b. Appendix K – Water Management Strategy;

    c. Appendix N – Letter—GWDPA;

    d. Appendix R – Letter re BAS Analysis; and

    e. Appendix S – GWDPA.

B. The NOI for the Southwest #1 Mine provides an adequate description of ground water resources to meet the requirements of R647-4-106.8. *See* NOI III.106.8, Depth to Groundwater at pp. 37-38. RLR meets the requirements of R647-4-109 by providing a narrative description of ground water impacts. *See* NOI VI.109.1: Projected Impacts to Surface and Groundwater Systems at pp. 40-42. Groundwater resources are also fully described in RLR's Groundwater Discharge

Permit Application ("**Groundwater Discharge Application Permit**"), dated December 20, 2011. *See* NOI Appendix "S."

C. The NOI confirms that records of nearby water wells retained by the Utah State Engineer, Division of Water Rights ("**DWR**"), reflect the following two deep isolated water bearing units: (i) a 1312 foot-deep well drilled in 1978 had a static water level of 475 feet and produced at the rate of 9 gallons per minute during a pump test and (ii) in a 1360 foot deep well producing 17 gpm. NOI p. 38. In addition, RLR has drilled a 900-foot deep well which produces 15 gallons per minute. The NOI provides that ground water is not susceptible to mining operations because it is isolated by several hundred feet of low permeability marlstone. NOI p. 42.

D. The observed depth to ground water is consistent with data from other wells in the general area (set forth at Table 1, p, 18-19, Groundwater Discharge Permit Application), and with published reports described in the NOI. *See* NOI, Appendix S.

IV. THE PROJECT DESIGN WILL PREVENT CONTAMINATION OF LOCAL GROUND WATER RESOURCES

A. Norwest has studied the backing walls to support the capsules and reclamation of the Project site and this analysis is included as an Appendix to the NOI. *See* Norwest's Geotechnical Analysis dated April 21, 2011, Appendix I to the NOI. The Norwest Analysis included recommendations to evaluate bedrock strength and conditions within the capsule that might affect the design of the backing wall.

recommendations are reflected in the current design set forth in the NOI submitted in RLR's NOI, dated September 1, 2011, as approved by DOGM. The major elements of capsule design are also addressed in the ground water discharge permit application on file with DWQ. *See* §§ 11, 12, 13, Groundwater Discharge Permit, NOI, Appendix S, pp. 25-40. This design is further assured by RLR's proposed monitoring plan, reclamation requirements and revegetation requirements as indicated in the NOI.

B. The DWQ has used the HELP model to assess the penetration of moisture. The HELP model was designed to access how moisture moves into the cover of the capsules. Cover includes vegetation as well as a foot of suitable growth medium, 1-2 feet of regraded overburden, and three feet of BAS.

C. The results of modeling for a 30-year time period resulted in water draining through the BAS at an average rate of 0.006 inches per year.

D. In my opinion, the effectiveness of the cover system is supported by the HELP model. However, the application of this model is not a requirement of DOGM's Minerals Program. Living River's witness Elliott Lips' use of volume of water rather than rate of water movement through the BAS cap is an inappropriate and misleading use of the HELP model results. The capsule size used in the model is greater than 10 acres, and simply looking at volume instead of the rate of water movement through the system is not what the HELP model is intended to demonstrate. The volume of water varies linearly with the modeled capsule area

and the cap design is not better or worse with changing capsule size. The HELP model predicts a rate of water movement, based upon several factors including precipitation, evapo-transpiration, estimated transmissivity of the BAS cap and the other layers of the cover system (vegetation, 1' of soil, and 2' of suitable cover).

The model result that Mr. Lips is referring to is the "base case" scenario, not the "best case" scenario from the Reclamation Cover Performance Modeling (HELP), in the GWDPA, Appendix S of the NOI. The base case is the case where the site is assumed to be revegetated and reclaimed as required under a permit issued by DOGM. It predicts water movement which can move downward, as well as upward in the cover system depending upon the amount of moisture (precipitation) received over time and the evapo-transpiration removes water from the cover system. By contrast, the "best case" scenario is not defined by Mr. Lips and is not the scenario upon which the HELP model is based.

It should also be noted that in contrast to the reported modeled results of water moving through the BAS at an average rate of 0.006 inches per year, there could be less precipitation or higher evapo-transpiration than the modeled values thereby reducing the rate of water movement. Additionally, the BAS could actually be less transmissive than was modeled, resulting in less moisture penetrating the cover system. The permeability rate of 10 to the minus 7 is the BAS target design parameter. Any lower permeability rate would reduce the rate of water movement through the BAS cap.

E. In my opinion, RLR's NOI fulfills all of the requirements of the applicable Division rules and regulations under the Minerals Program. The Division properly conditioned the NOI upon DWQ's further determination regarding the need for an approved GWPDA.

FRANCIS A. AMENDOLA

CERTIFICATE OF SERVICE

I hereby certify that on June 18, 2012 a true and correct copy of the foregoing **RED LEAF RESOURCES, INC.'S EXPERT WITNESS REPORT, FRANCIS A. AMENDOLA, NORWEST CORPORATION**, as corrected to add page 7, was served by e-mail and U.S. mail, postage prepaid, to the following:

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EXHIBIT A

Fran Amendola is VP Environmental Affairs for Norwest Corporation. Norwest Corporation is a mining, energy and environmental consulting firm with operations worldwide. He is based in Salt Lake City, Utah. Norwest is staffed with mostly senior professionals who provide support on complex mining issues throughout the U.S. as well as internationally. Mr. Amendola has almost 30 years of experience in reclamation planning and execution, permitting, and regulatory compliance in the mining and energy industries.

Mr. Amendola's undergraduate degree is in Political Science from the University of Pittsburgh. He later pursued a Master of Science Degree in Forest Resource Management. His undergraduate work provided a solid education for understanding the regulatory process. Following his completion of his undergraduate education, Mr. Amendola entered graduate school in Forest Resources and completed both undergraduate and graduate requirements to receive a Master of Science degree in Forest Resource Management from the Pennsylvania State University with an emphasis in mine land reclamation. His graduate program included course work in mining and environmental resource management. His thesis focused on aluminum toxicity at coal mines.

His work experience includes operations and corporate responsibilities at both coal and hardrock mining operations. He served as an Environmental Coordinator for Permits and Compliance for Westmoreland Resources (1980-1984+) for almost 5 years managing regulatory compliance for all environmental regulations, and supported major permitting efforts. He also held positions as a Corporate Scientist and Environmental Supervisor for Kennecott Energy (formerly NERCO) where he managed environmental issues associated with soils and overburden, and developed permit applications for several properties in Montana and Wyoming. Additionally, he managed compliance issues for properties in West Virginia for a two year period. In that capacity, he was responsible for managing compliance and obtaining bond release for over 20 properties. He also managed water quality compliance issues associated with the properties.

He served as Senior Regulatory Analyst for Kennecott Corporation in Salt Lake City, UT where he reviewed, interpreted and implemented applicable environmental requirements for mining operations in Wyoming, Montana and Utah. He provided technical support in the interpretation of new regulatory requirements and establishing programs on the ground that met these requirements. He has worked complex regulatory issues for much of his career including permitting large mining applications, as well as addressing compliance issues with air/land/water resources.

Since joining Norwest in 2004, Mr. Amendola has worked on numerous projects in all aspects of the mining and energy sectors. His expertise is mainly in mine reclamation, permitting, environmental compliance and NEPA projects.